IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SUBMISSION OF CERTIFIED TRANSLATION OF PRIORITY DOCUMENT

APPLICANTS:	Jochen Dick et al.	GROUP ART UNIT: 2628
SERIAL NO.:	10/518,143	EXAMINER: Crystal A. Murdoch
FILED:	August 2, 2005	CONFIRMATION NO.: 6780
TITLE:	CROSS-PLATFORM AND DATA-SPECIFIC VISUALIZATION OF 3D DATA RECORDS	

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

S I R:

Applicants herewith submit a certified translation of German Application 102 27 308.1, filed in the German Patent and Trademark Office on June 19, 2002, on which Applicants base their claim for convention priority under 35 U.S.C. §119.

Submitted by,

Steven H. Noll (Reg. 28,982)

Schiff, Hardin LLP
CUSTOMER NO. 26574
Patent Department
6600 Sears Tower
233 South Wacker Drive
Chicago, Illinois 60606
Telephone: 312/258-5790
Attorneys for Applicants.

CH1\5616512.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

TRANSLATOR'S DECLARATION AND CERTIFICATE

APPLICANT: Dick et al.

SERIAL NO.: 10/518,143

FILED: August 2, 2005

TITLE: "CROSS-PLATFORM AND DATA-SPECIFIC VISUALIZATION OF 3D DATA SETS"

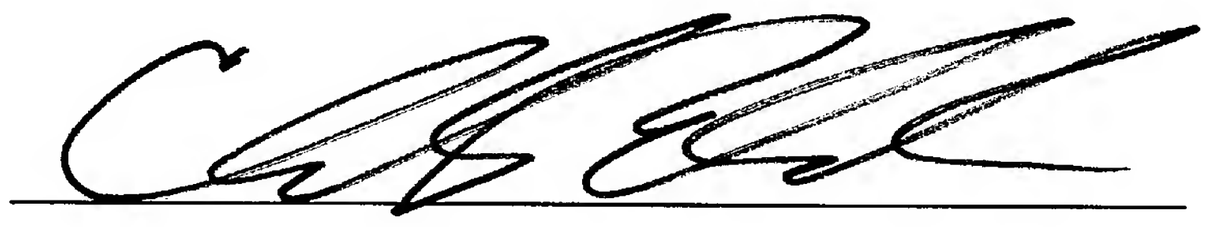
Commissioner for Patents
Box 1450
Alexandria, VA 22313-1450

S I R:

I, Charles Bullock, declare and state that I am knowledgeable in German and English, and I hereby certify that the attached translation of the attached German Priority Application 102 27 308.1, filed in the German Patent and Trademark Office on 19 June 2002, is truthful and accurate to the best of my knowledge.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

DATE: 19 March 2008



Siemens AG
Certified translation of priority document
Case No. P04,0501 (26965-3342)
Client Ref. No. 2002P05093 WOUS
Inventor: Dick et al.

Translation / March 19, 2008 / C. Bullock

FEDERAL REPUBLIC OF GERMANY

Priority Document concerning the Submission
of a Patent Application

File number:	102 27 308.1
Application date:	19 June 2002
Applicant/patent holder:	Siemens Aktiengesellschaft, Munich/DE
Title:	Cross-platform and data-specific visualization of 3D data sets
IPC:	G 06 T 17/00

The attached pieces are a correct and precise reproduction of the original documents of this patent application.

Munich, the 30th of June 2003
German Patent and Trademark Office
The President
by order
[signature]
Jerofsky

Specification

CROSS-PLATFORM AND DATA-SPECIFIC VISUALIZATION OF 3D DATA SETS

The invention relates to a device for cross-platform and data-specific visualization of 3D data sets by means of a visualization software for display on a 2D monitor.

Due to migration of 2D exposures to 3D volume data sets the problem occurs that the volume data must be exchanged among doctors and visualized on different computers. In order to ensure a uniform image quality, in addition to the medical data set a program that permits the visualization of the 3D data on the 2D monitor must be provided. The use of different methods for volume visualization as well as the many possibilities for parameterization of the algorithms lead to a different image quality.

To date, the exchange of such volume data has for the most part been conducted in that the volume data set was transferred via a DICOM interface to a medical workstation at which an expensive volume visualization software is installed, wherein difficulties can also occur here in turn when this volume visualization software is not the same as that which was used on the original computer of the radiologist.

In addition, individual views of the volume data set have also been generated, stored in a standard image format and passed on. Images can be viewed on any arbitrary PC with standard programs such as Photoshop, for example. Finally, it has also already been proposed to acquire a plurality of fixed views in a set sequence as a digital video (avi, for example) and then play them back with standard software tools.

It is therefore the object of the invention to achieve a device for cross-platform, data-specific visualization of 3D data sets which, given a simple design, operates independently of the computers respectively used and of any possible visualization

software, and thus permits 3D volume data sets to also be ordered and viewed by any third parties with the best play back quality.

To achieve this object, it is inventively provided that the 3D volume data are stored together with visualization software on a data medium, and this data medium is transmitted to a user for play back on an arbitrary PC.

Via the storing the 3D volume data set together with any (arbitrary) visualization software, the 3D volume can be visualized on any PC without software additionally installed on this PC. Moreover, the unit of data set and visualization algorithm ensures that there is no general visualization tool with which the arbitrary data sets can be displayed.

In a development of the invention it can thereby be provided that the visualization parameters are also stored (invariable at least in part) on the data medium. The advantageous possibility thereby results of a 3D volume data set, produced by a radiologist, in which specific structures have been specially emphasized via specific visualization parameters, for example are made available to the surgeon in the operating room, wherein this surgeon then also sees precisely the structures that the radiologist has emphasized via the visualization parameters on the basis of his specialist knowledge. In many cases, it can be expedient, precisely given the transmission of such 3D data to less experienced doctors, to not leave all possibilities of selecting the various visualization parameters to these less experienced doctors, since in most cases they are completely overtaxed with these and ultimately are unable to extract any useful image at all from the data. By storing the 3D volume with the visualization software and the visualization parameters found by the radiologist to be the best possible display of a specific structure on a data medium, preferably a CD, the problem of passing on such 3D volume data sets among doctors can be solved in a simple manner in such a way that passing them on is very simple, that the receiver requires no special facilities (expensive visualization software on his work station), and that the data of the 3D volume data set that are of interest to the receiver can be passed on such that even a non-radiologist obtains an optimum display. Of course, even in such a case with fixed visualization parameters the possibilities of spatially rotating the 3D volume

data set (for example with specially emphasized bone structures or else arborizations) and of regarding them from all possible points of view for preparation of the operation remain with the surgeon.

Further advantages, features and details of the invention emerge from the following description of an exemplary embodiment as well as using the drawing, which schematically shows the reproduction of a 3D volume data set onto a 2D monitor.

In the generation of a 3D volume data set, the volume of interest is transirradiated from an optical center 1 and points lying on the line of transirradiation are imaged in an image plane. A 3D volume data set can be calculated via an algorithm from a plurality of two-dimensional images produced from different optical centers 1. In the reconstruction shown in the Figure of the 3D data set on a 2D monitor 2, the points lying on a projection ray 3 are added to the 3D volume V in accordance with variable points of view (specifically the so-called visualization parameters, for example with their gray-scale values) and are mapped on the 2D monitor 2 as a pixel. The setting of the visualization parameters is thereby a particularly difficult art that only experienced radiologists master, while normal doctors are able only with great difficulty to single out the structures they desire from a 3D volume data set. For example, depending on the setting of the visualization parameters, arborizations in the 3D volume V, for example, are specially emphasized, or else specific bone structures or other medical details. If these visualization parameters are recorded (in particular are burnt onto a CD) by the recording radiologist on a data medium together with the visualization software respectively used and the 3D volume data, this data medium can very easily be sent to a doctor or another department of a hospital where a simple PC requiring no special installations of any sort for visualization (thus in particular on which no expensive visualization software needs to be installed) is sufficient for visualization. The simultaneous co-storage of the visualization parameters, optimally such that the receiver is no longer capable of changing them, has the advantage that even less experienced doctors can view on their simple PC with the best image quality precisely the structures emphasized by the radiologist.

An exemplary scenario could thereby look as follows:

A neuroradiologist generates a three-dimensional volume data set with an angiography system, edits the volume in such a way that an aneurism is well visible, and burns a CD for the neurosurgeon. This neurosurgeon takes the CD, plays this on a standard PC and can visualize and analyze the 3D data set directly. He is not dependent on a special work station, can inspect the data set on any desired computer, and can still do so with the same quality as his colleague in neuroradiology.

Patent Claims

1. Device for cross-platform and data-specific visualization of 3D data sets by means of visualization software for display on a 2D monitor, characterized in that the 3D volume data are stored together with a visualization software on a data medium and this is transmitted to a user for playback on an arbitrary PC.

2. Device according to claim 1, characterized in that the visualization parameters are also stored on the data medium in an at least partially unchangeable fashion.

3. Device according to claim 2, characterized in that the data medium is a CD.

Abstract

Cross-platform and data-specific visualization of 3D data sets

Device for cross-platform and data-specific visualization of 3D data sets by means of visualization software for display on a 2D monitor, wherein the 3D volume data are stored together with a visualization software on a data medium and this is transmitted to a user for playback on an arbitrary desired PC.